



# 2023 World Radiocommunication Conference Agenda Item 1.7

## Space based VHF

**AMS(R)S allocation in 117.975-137 MHz band**

ESAF/WACAF Regional Workshop  
Preparation for WRC-23  
26-27 April 2022  
CAA Singapore

# Background



- Air navigation services limited by **line-of-sight** coverage of **terrestrial** systems
- Constrained by **separation** procedures between aircraft in **oceanic** and **remote areas**
- Reduced airspace **capacity and efficiency**

## Objective

- VHF communications **relay via satellite** in oceanic and remote airspace
- **Complement** current aviation use of satellite-based **navigation** and **surveillance** technologies
- Ease implementation with **no change** in **aircraft avionic** equipment
- **Minimal or no change** to current **operations** and **SARPs**
- **Backup terrestrial** systems

# Agenda Item 1.7 – Resolution 428

resolves to invite the  
ITU  
Radiocommunication  
Sector

- to define the relevant **technical characteristics**
- to **study compatibility**
- in Earth-to-space and space-to-Earth **directions**
- with **existing primary services** in-band & adjacent bands
- ensuring **protection of systems** using these services
- not constraining **planned usage** of those systems;
- taking into consideration the **responsibility of ICAO**;

Completed

Mostly Completed

Completed

Completed

Completed

Completed

Completed

invites the  
International Civil  
Aviation  
Organization

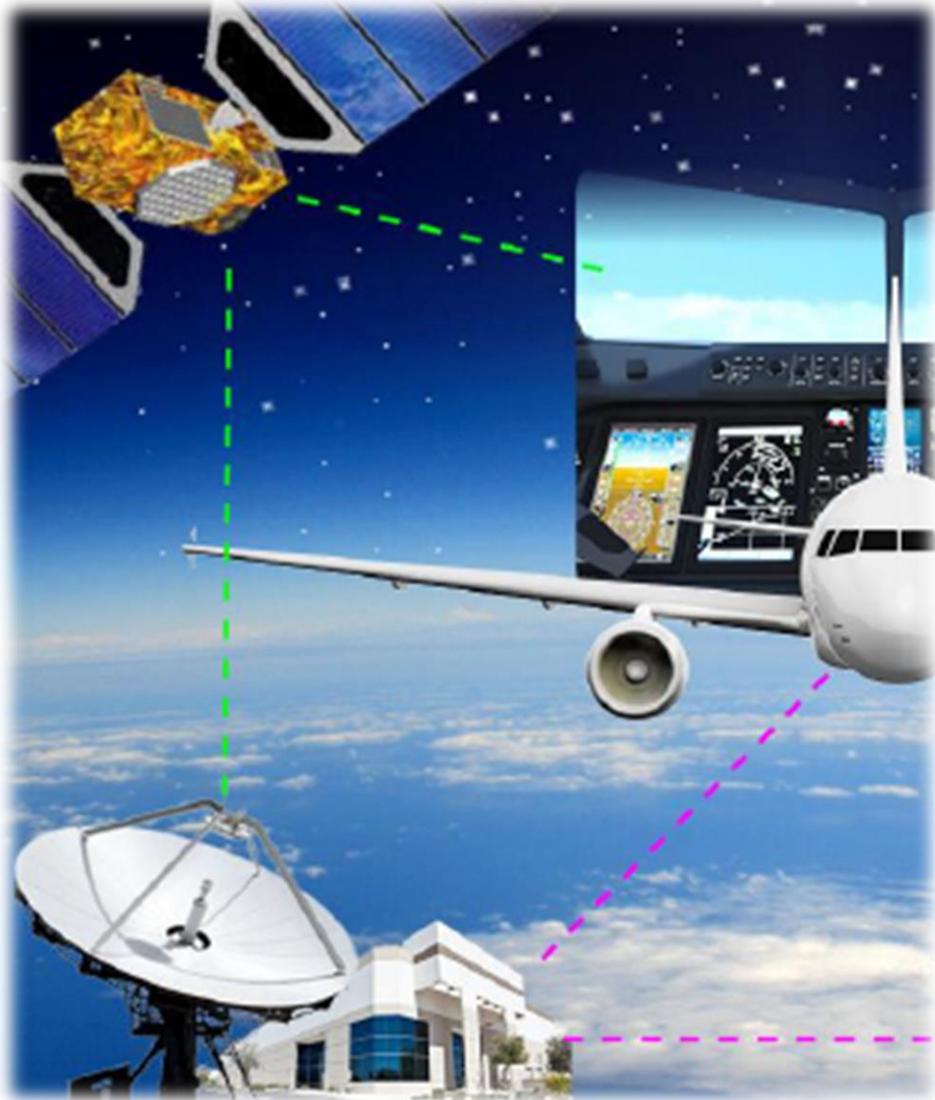
- to provide aeronautical **operational requirements** and relevant available **technical characteristics**
- to take into account the sharing and compatibility conclusions at ITU-R in the **SARPs to be developed** for AMS(R)S

Completed

In progress

# WD towards a PDN Report ITU-R M.[SPACE-VHF]

## Summary of technical & operational studies



Aircraft VHF radio

Doppler shift and latency

Ionospheric scintillation

Polarization (Circular)

Satellite-aircraft range

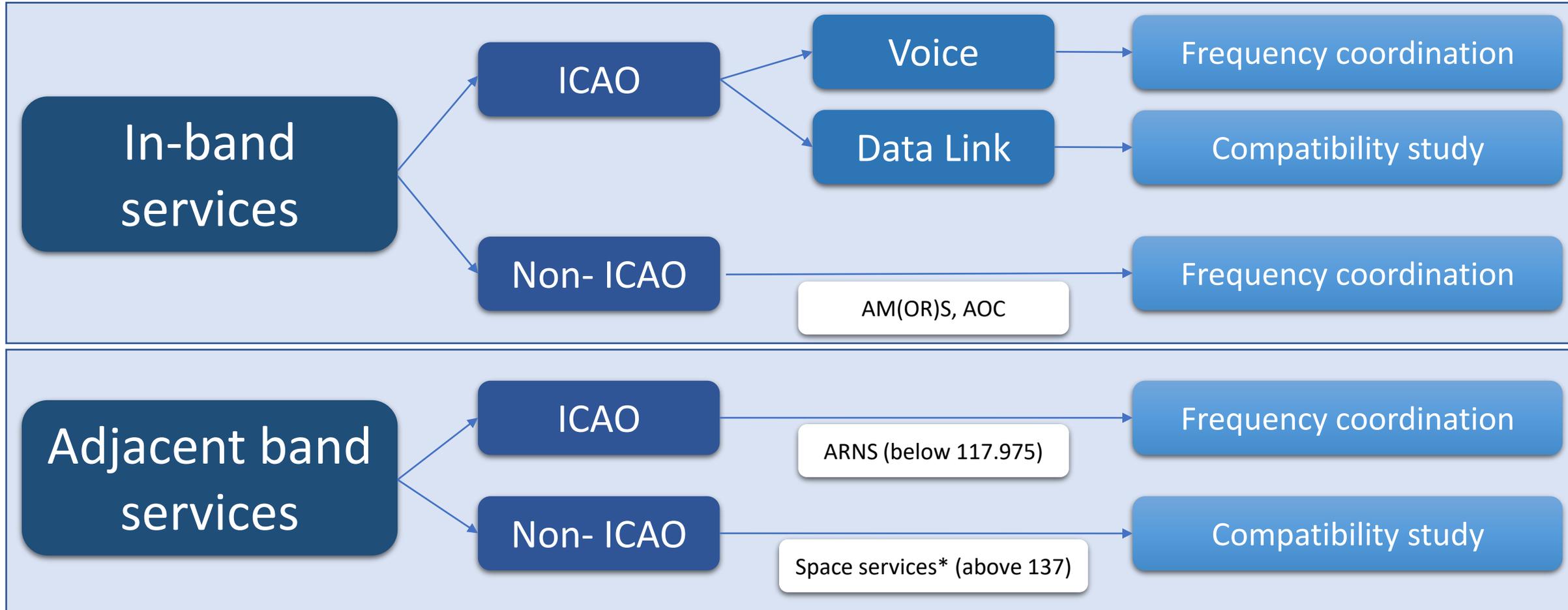
Payload antenna

Baseline link budgets

Feasible solution found using low-Earth orbit satellite

# WD towards a PDN Report ITU-R M.[SPACE-VHF]

## Coexistent and Compatibility



\* Space services in the band 137-138 MHz consist of Space Operation, Meteorological, Space Research and Mobile Satellite Services

# WD towards a Draft CPM Text for WRC-23 Agenda Item 1.7

## Proposed Methods

### Method A

“No Change” to the Radio Regulation i.e. frequency allocation **NOT** granted.

### New AMS(R)S allocation:

### Method B

AMS(R)S allocation in the band **117.975-137 MHz**

- Limiting to internationally standardized aeronautical systems
- Ensuring protection of AM(OR)S service in the band 132-137 MHz
- Ensuring protection of services in adjacent bands\* and not constraining these services

### \* Protection of adjacent band services:

- Studies are on-going for the protection of services operating above 137 MHz through:
  - 1 MHz guard band in 136-137 MHz
  - limit [pfd value to be determined] on the level of unwanted emissions above 137 MHz

# ICAO Position and Recommendation



- To **support ITU-R studies** and the definition of relevant technical characteristics as called for by Resolution 428 (WRC-19).
- To **support a global allocation** to the aeronautical mobile-satellite (route) service for both the Earth-to-space and space-to-Earth directions in the frequency band 117.975-137 MHz and that the use of the allocation be **limited to the relaying of aeronautical VHF air traffic management communications**.
- To support that those systems shall operate in accordance with **international Standards and Recommended Practices** and procedures established in accordance with the Convention on International Civil Aviation.
- To ensure that any change to the regulatory provisions and spectrum allocation resulting from this agenda item **do not adversely impact the operation of existing VHF systems** in the band 117.975-137 MHz operating in the AM(R)S, including regional usage of terrestrial VHF, **nor require any changes to aircraft equipment or to existing installations**.

## Recommendation

- **To participate in the national preparatory meetings as well as the ITU Regional Groups for WRC and to convince the national telecom regulators to support Method B\* of AI 1.7**

\* Subject to further changes from now till CPM23-2

Questions?

